

## **Chapter 6 Records**

### **A. General**

Records of a sewage treatment facility are an important part of good operation in order to have the value of past experience in present activities. Records and reporting are also a statutory obligation imposed on the City by the Missouri Department of Natural Resources through the NPDES permit program.

Financial records are needed by the Board of Aldermen in order to properly budget the operating fund and adjust user charges as required.

### **B. Daily Operating Log**

Operating records should be kept on all routine and unusual operating events. A diary type log should be used showing a variety of useful and important information including maintenance work, failure of a piece of equipment, accidents, unusual weather, flooding, overflowing, complaints, visitors, etc. The log should be made out in sufficient detail to permit a third party to determine what happened at the event and what action was taken.

A record should also be kept on the mechanical equipment including checks of various component parts. A maintenance plan should be kept indicating inspections to be made and recommended frequency. A copy of this record sheet should be posted and initialed, as each item is completed.

A card system or file system can be set up on each piece of equipment at the facility. The file heading should describe the equipment, list serial and model numbers, and possibly part numbers. The maintenance function, such as greasing, oiling, periodic checks and the time required to perform this work, should be listed. A space for operator's initials and the date should be provided after each listing. The files will provide a complete history of the equipment, and the maintenance cost. The equipment maintenance chapter contains more information.

The results of all laboratory tests performed, including the required tests as outlined in Chapter 5 of the O&M manual, should be recorded in a permanent record.

In addition to the operating records, the actual laboratory work sheets showing calculations, should be kept for a month period to permit a recheck if data appears to be erratic.

A copy of each month's operating record on the facility components should be kept as a permanent record in a three-ring binder.

Forms have been developed for use in maintaining daily operating logs and daily operating records for sewage pump and air compressor running time. These forms are included in this chapter.

A key element in successful land application of sludge lies in keeping good records of 1) laboratory test results, 2) application site information, and 3) application schedules. Forms for maintaining complete records were developed and are included in this chapter. See Chapter 3, Section M and Appendices E, F and G for further information on land application of biosolids.

**Rockaway Beach, Missouri  
Daily Operating Log**

Date: \_\_\_\_\_  
Operator: \_\_\_\_\_

Influent Flow	Effluent Flow	Weather
_____	_____	_____
_____	_____	_____
_____	_____	_____
Waste Sludge	Temperature	
_____	_____	
_____	_____	
_____	_____	

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**Equipment Check List:** See Maintenance File and Schedule (Chapter 7 O&M Manual)

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|--|---|--|
| <p>1. Flow Meters</p> <p style="margin-left: 20px;">Influent #1 _____</p> <p style="margin-left: 20px;">Influent #2 _____</p> <p style="margin-left: 20px;">Bull Creek _____</p> <p style="margin-left: 20px;">Merriam Woods _____</p> <p style="margin-left: 20px;">Effluent _____</p>                      | <p>4. Bar Screen _____</p> <p style="margin-left: 20px;">Conveyor Press _____</p> <p>5. Oxidation Ditch</p> <p style="margin-left: 20px;">Motive Pumps _____</p> <p style="margin-left: 20px;">Aeration Blowers _____</p> <p style="margin-left: 20px;">Alum Feeder _____</p> | <p>10. Sludge Management _____</p> <p style="margin-left: 20px;">Aerobic Sludge Digestion rotors (oxidation ditch) _____</p> <p style="margin-left: 20px;">Thickeners (clarifier) _____</p> <p style="margin-left: 20px;">Storage (digester) _____</p> <p style="margin-left: 20px;">Drying beds _____</p> |
| <p>2. Lift Station</p> <p style="margin-left: 20px;">Chemical Odor Control _____</p> <p style="margin-left: 20px;">Influent Pump Run Time _____</p> <p style="margin-left: 20px;">Pump No. 1 _____</p> <p style="margin-left: 20px;">Pump No. 2 _____</p> <p style="margin-left: 20px;">Pump No. 3 _____</p> | <p>6. Clarifier _____</p> <p>7. Sludge Pit _____</p> <p>8. Filters</p> <p style="margin-left: 20px;">Backwash Pumps _____</p> <p style="margin-left: 20px;">Backwash Blower _____</p> <p style="margin-left: 20px;">Air Compressor _____</p>                                  | <p>11. Temperature Controls</p> <p style="margin-left: 20px;">HVAC in MCC _____</p>  |
| <p>3. Selector Basin Mixers _____</p>  | <p>9. UV System _____</p>   | <p>12. Fill Out Maintenance Schedule _____</p>   |

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Sludge Hauled _____	Screenings Removed _____
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**Testing – Summary & Observations**

pH Influent	D.O. Influent	BOD <sub>5</sub> Influent
_____	_____	_____
pH Effluent	D.O. Effluent	BOD <sub>5</sub> Effluent
_____	_____	_____
Suspended Solids Influent	D.O. Aeration Basins	MLSS
_____	_____	_____
		MLVSS
		_____
Suspended Solids Effluent	COD Influent	SVI
_____	_____	_____
Settleable Solids Influent	COD Effluent	Settleability
_____	_____	_____
Odor		SDI
_____		_____
Color		
_____		

Comments:

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Visitors:

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Complaints:

Month \_\_\_\_\_

[illegible]

Suspended Solids and Volatile Solids Test									
Sample Date	Sample I.D.	Sample Volume Before Filtration (mL)	Initial Weight of Filter Alone (g)	2nd Weight of Filter + Dried Residue (g)	2nd Weight-Initial Weight (g)	Suspended Solids (mg/L)	3rd Weight of Filter + Residue After Furnace (g)	2nd-3rd Weight (g)	Suspended Volatile Solids (mg/L)

DRYING OVEN TEMP. \_\_\_\_\_ TIME IN \_\_\_\_\_ TIME OUT \_\_\_\_\_ WORKER I.D. \_\_\_\_\_

FURNACE TEMP. \_\_\_\_\_ TIME IN \_\_\_\_\_ TIME OUT \_\_\_\_\_

$$SUSPENDED SOLIDS (mg/L) = \left( \frac{2nd \text{ weight in grams} - initial \text{ wt. in grams}}{sample \text{ volume (mL)}} \right) \times \left( \frac{1,000 \text{ mg}}{g} \right) \times \left( \frac{1,000 \text{ mL}}{L} \right)$$

$$VOLATILE SOLIDS (mg/L) = \left( \frac{2nd \text{ weight in grams} - 3rd \text{ weight in grams}}{sample \text{ volume (mL)}} \right) \times \left( \frac{1,000 \text{ mg}}{g} \right) \times \left( \frac{1,000 \text{ mL}}{L} \right) \quad ^{21}$$

## MAINTENANCE FILE SAMPLE

1. Maintenance File  
Manufacturer

Supplier

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Maintenance Required - See Manufacturer's Information

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Nameplate Data:

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Recommended Spare Parts List:

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Equipment Maintenance
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Equipment No.	Description:
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Equipment No.	Description:
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[illegible]



Facility Name: \_\_\_\_\_ Date: \_\_\_\_\_

### Wastewater Treatment Sludge Land Application Summary

for Landowner/Operator

Landowner: \_\_\_\_\_ Field No. \_\_\_\_\_

Location: \_\_\_\_\_

1. **RECOMMENDED SLUDGE APPLICATION RATE** (contact the facility manager if a higher application rate is desired for meeting crop requirements)

\_\_\_\_\_ dry tons/acre/year \_\_\_\_\_ gallons/acre/year \_\_\_\_\_ % solids  
Crops \_\_\_\_\_

2. **FERTILIZER APPROXIMATION** (this is not a guaranteed rate per load but is an approximate average based on the latest sample analysis data)

N \_\_\_\_\_ lbs/dry ton of sludge \* \_\_\_\_\_ sample dates  
P \_\_\_\_\_ lbs/dry ton of sludge  $\times 2.27 =$  \_\_\_\_\_  $P_2O_5$  lbs/dry ton sludge  
K \_\_\_\_\_ lbs/dry ton of sludge  $\times 1.2 =$  \_\_\_\_\_  $K_2O$  lbs/dry ton sludge  
\* Estimated plant available nitrogen = \_\_\_\_\_ lbs/dry ton sludge

3. **OTHER RECOMMENDATIONS** (items checked are applicable to this field)

- a. \_\_\_\_\_ 0-6% slopes: no slope limitations.  
b. \_\_\_\_\_ 7-12% slopes: surface apply to pasture or hayland or subsurface injection on row cropland  
c. \_\_\_\_\_ 7-12% slopes: approved soil conservation practices allow surface application of sludge to cropland.  
d. \_\_\_\_\_ over 12% slopes: approved for use with special management practices on dense stands of hay or pasture; limit application to dry soil conditions.  
e. \_\_\_\_\_ Leave \_\_\_\_\_ feet buffer from \_\_\_\_\_  
f. \_\_\_\_\_ Leave \_\_\_\_\_ feet buffer from \_\_\_\_\_  
g. \_\_\_\_\_ DO NOT graze cattle for at least 30 days after sludge application.  
h. \_\_\_\_\_ DO NOT apply sludge within 30 days of crop harvest.  
i. \_\_\_\_\_ DO NOT graze lactating dairy cattle for at least \_\_\_\_\_ days after sludge application to pasture.  
j. \_\_\_\_\_ DO NOT raise garden crops for at least one year after sludge application.  
k. \_\_\_\_\_ Apply lime according to University Soil Test recommendations to raise soil Ph to above 6.0 before sludge is applied.  
l. \_\_\_\_\_ Post NO TRESPASSING signs to limit unauthorized access to the site.  
m. \_\_\_\_\_ OTHER: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Land Application Site Log Sheet

LANDOWNER:

YEAR
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Location Directions:					

Fields acres:

[illegible]

## Chapter 7

### Equipment Maintenance

#### A. Description of Maintenance Management Program

A sound maintenance program is important to insure that the equipment functions properly at the lowest cost to the citizens of the community. Routine and minor maintenance can be performed by the operator with occasional assistance from other personnel. Major repair or replacement will be completed by the equipment manufacturers or equipment suppliers.

#### B. Planning and Scheduling

Maintenance of mechanical equipment is covered in this chapter. See Chapter 3 for general maintenance and operation recommendations for each component part of the system.

The manufacturer's operation and maintenance instructions are a part of this manual, as separate volumes or as Appendixes in Volume 3. The Appendix contains operation and maintenance information and manuals for the following items:

Type of Equipment	Specification Section
1. Influent Sewage Pumps	11212 (2.04 to 2.10)
2. Chemical Feeding Equipment	
a. Alum Feeder, for advanced Phosphorus removal	11240 (2.02)
b. Ferrous Sulfate Feed System, for Odor Control	11240 (2.03)
3. Pretreatment Equipment	
a. Automatic Barscreen	11300 (2.08)
b. Barscreen Conveyor Press	11300 (2.09)
4. Oxidation Ditch Aeration System	
a. Jet Aeration Header	11300 (2.02, D)
b. Motive Pumps	11300 (2.02, L)
c. Aeration Blowers	11300 (2.02, M)
5. Clarifiers Sludge Collection Header and Surface Skimmer	11300 (2.03)
6. Gravity Filters	11300 (2.05)
a. Air Compressor (for Pneumatic Valves)	11370 (2.01)
b. Air Scour Blower	11300 (2.05, E5)
c. Backwash Pumps	11300 (2.05, F)
7. Ultraviolet Disinfection System	11300 (2.06)
8. Selector Basin Mixers	11300 (2.07)

- |   |              |
|---|--------------|
| 9. Valves   | 15400 (2.06) |
| 10. Portable Generator  | 16620 (2.01) |
| (To power UV, Backwash Pump & Blower, and Filter Building Lights) |              |

The manufacturer's manuals contain complete details on routine maintenance and on "trouble shooting" procedures. They should be closely followed in order to keep the equipment in good operating condition.

A maintenance record system utilizing a simple 8½ x 11-inch filing system is recommended. A file folder should be set up for each piece of equipment. Existing equipment, such as aeration equipment used for sludge digestion, should also have maintenance record folders. The major equipment requiring maintenance folders are:

1. Lift Station
  - a. Sewage Pumps
  - b. Chemical Feed Equipment for Odor Control
2. Bar Screens – Automatic
3. Oxidation Ditch Aeration System
  - a. Jet Aeration Header
  - b. Motive Pumps
  - c. Aeration Blowers
4. Selector Basin Mixers
5. Alum Feeder for advanced Phosphorus removal, (located in blower room)
6. Filter Building:
  - a. Air Compressor
  - b. Air Scour Blower
  - c. Backwash Pumps
7. Ultraviolet Disinfection System
8. Influent Flow Meters (two located in influent manholes)
9. Effluent Flow Meter (located in UV disinfection channel)
10. Miscellaneous:
  - a. Cranes
  - b. Valves
  - c. Slide/Sluice Gates

Some major equipment information sheets are included following. Copies of these sheets should be included in each of the applicable maintenance files. This equipment is numbered in the preceding list. The files should also be numbered.

The nameplate data and serial numbers should be included on these sheets when the equipment is received.

It is very important that the date and type of maintenance performed on each item of equipment should be recorded on an equipment maintenance sheet. An example equipment maintenance sheet is provided following. This form can be copied and utilized in the maintenance program. The operator may want to include the time required to perform the different maintenance functions for use in future scheduling and planning.

No outside contract maintenance should be necessary at this facility. The equipment supplier or manufacturer should be contacted for service or repair beyond the scope of City personnel.

The cost of repairs and purchases for the system should be kept by the Head Operator. This will allow the Board of Alderman to prepare budgets and adjust the sewer user charges as required annually. The sewer user charge ordinance should be reviewed for additional information.

**Maintenance File**

**Manufacturer:**

**Supplier:**

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**Maintenance Required - See Manufacturer's Information**

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**Nameplate Data:**

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**Recommended Spare Parts List:**

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**Warranty:**

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The planning and scheduling of maintenance can be done so that no time consuming maintenance is required during weekends and holidays.

Emergency situations and maintenance should always take priority over routine and preventive maintenance functions.

A form for monthly scheduling of the different maintenance functions is included for review and use in the planning and scheduling of maintenance. The monthly maintenance form can be posted and checked as the maintenance is completed. When maintenance is scheduled for one of the eight items, a **O** should be placed on the schedule. The **O** could be marked with an **X** when the work is completed, example: (**Ø**)



# Monthly Maintenance Schedule: Rockaway Beach Sewage Treatment Facility

Month \_\_\_\_\_ Year \_\_\_\_\_ Maintenance Scheduled - 0 Maintenance Completed - ~~0~~

1a. Lift Station  
Pumps

1b. Chemical Odor  
Equipment

2. Automatic  
Barscreen

3a. Jet Aeration  
Header

3b. Motive  
Pumps

3c. Aeration  
Blowers

Day

1

2

3

4

5

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20

21

22

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## Monthly Maintenance Schedule: Rockaway Beach Sewage Treatment Facility

Month \_\_\_\_\_ Year \_\_\_\_\_ Maintenance Scheduled - 0 Maintenance Completed - ~~0~~

4. Selector Basin  
Mixers

5. Alum Feeder

6a. Filter Building  
Air Compressor6b. Filter Building  
Air Scour Blower6c. Filter Building  
Backwash Pumps

7. UV System

Day

1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					

Month \_\_\_\_\_ Year \_\_\_\_\_ Maintenance Scheduled - 0 Maintenance Completed - ~~0~~

8. Influent Flow

9. Effluent Flow

10a. Miscellaneous

10b. Miscellaneous

10c. Miscellaneous

Day	Meters	Meters	Cranes	Valves	Slide/Sluice Gates
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					

## Equipment Maintenance

Equipment No. \_\_\_\_\_  
Description \_\_\_\_\_

[illegible]

**C. Emergency Corrective Maintenance**

Emergency corrective maintenance and recommended spare parts and lists of special equipment are included in the maintenance manuals.

It is important for the operators to make certain all costs related to emergency maintenance are entered onto record forms.

**D. Sewer Maintenance Program**

In addition to the wastewater treatment plant, it is important for the operator to maintain the collection system.

1. Daily Tasks of Maintenance Crew

- a. Inspect and clean manholes.
- b. Remove obstructions.
- c. Perform minor repairs.

2. Tasks as Needed

- a. Televising lines.
- b. Smoke testing.
- c. Rehabilitation.

3. Evaluation Procedures

- a. Infiltration/inflow analysis.
- b. Soil cavitation.
- c. Visual grade variance.

## Chapter 8

### Emergency Operating and Shut-Down Procedures

#### A. General

With proper maintenance and operation, there should be relatively few conditions of an emergency nature that require special operating procedures. The major mechanical components of this wastewater treatment facility have duplicate units, permitting one to be taken out of service for maintenance or repair while the other is kept in service. It is important that the work of repair be done as soon as possible to avoid having an emergency overflow, thus creating unsanitary conditions. Spare parts should be kept on hand for immediate replacement needs.

The operators should be trained in first aid. An industrial first aid kit should be purchased and maintained at a location known to all personnel.

A list of emergency telephone numbers should be posted. The following numbers should be included on this list:

	<u>Emergency</u>	<u>Non-Emergency</u>
Fire:	911	
Police:	911	(417) 561-4424, daytime After hours - Call Taney County Sheriff.
Sheriff:	911	(417) 546-7250
State Patrol:	911	1-800-525-5555
Ambulance:	911	
Skaggs Community Hospital:		(417) 546-3500 Forsyth (417) 739-2520 Kimberling City
Project Engineer: The Larkin Group		(816) 361-0440
MoDNR – Southwest Regional Office:		(417) 891-4300
White River Electric Co-op:	(417) 335-9335	(417) 335-9335

### ***Environmental Emergency Notification Procedure***

In the event of a bypass of raw sewage or discharge of inadequately treated wastewater, the operator is requested to notify the Missouri Department of Natural Resources by calling the appropriate regional office (See Figure 8). The nearest MoDNR office to the Rockaway Beach WWTP is the Southwest Regional Office in Springfield, phone (417) 891-4300.

For any emergency situation involving major releases, hazardous materials, contaminated water supplies, or fish kills, the operator is requested to notify the appropriate MoDNR regional office immediately. After hours and on weekends and holidays, the Department should be notified for these emergencies by calling the 24-hour Environmental Emergency Response number.

In case of an environmental emergency call:

#### **Missouri Department of Natural Resources:**

Southwest Regional Office	(417) 891-4300
Emergencies only, answered 24-hours a day	(573) 634-2436

#### **U.S. Environmental Protection Agency:**

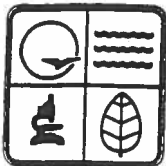
National Response Center (NRC)	1-800-424-8802
Region VII (24 hours spill reports)	(913) 281-0991

#### **EPA Assistance with General Spill Reporting:**

Region VII	(913) 551-7020
EPA Hotline	1-800-535-0202

Copies of all essential records including this operation and maintenance manual, sewer plans, sewer maps, and drawings should be kept in the City Hall for emergency use. The operating and emergency repair personnel should have copies of system maps for use in emergencies.

The emergency operating and response program is simple but should be coordinated with the police and fire departments in the following manner. Both police and fire department personnel must be prepared to assist during emergencies at the facilities. The fire department should provide first aid instruction to the operator. The fire extinguisher and the sewerage facilities should be checked for problems or hazards.



# MISSOURI DEPARTMENT OF NATURAL RESOURCES

## DIVISION OF ENVIRONMENTAL QUALITY

### REGIONAL OFFICES

**Kansas City Regional Office**  
 500 NE Colbern Rd  
 Lee's Summit, MO 64086-4710  
 (816) 554-4100  
 FAX: (816) 554-4142

**Northeast Regional Office**  
 1709 Prospect Dr.  
 Macon, MO 63552-2602  
 (660) 385-2129  
 FAX: (660) 385-6398

**Jefferson City Regional Office**  
 1511 Christy Dr.  
 P.O. Box 176  
 Jefferson City, MO 65102-0176  
 (573) 751-2729  
 FAX: (573) 751-0014

**Lake of the Ozarks Satellite Office**  
 Lee C. Fine Airport  
 Hwy 134  
 Kaiser, MO 65047  
 (573) 348-2442

**St. Louis Regional Office**  
 10805 Sunset Office Drive  
 St. Louis, MO 63127-1017  
 (314) 822-0101  
 FAX: (314) 822-0943

**Lincoln County Satellite Office**  
 Cuivre River State Park  
 878 State Rt. 147  
 Troy, MO 63379  
 (314) 528-4779

**Franklin County Satellite Office**  
 Meramec State Park  
 Hwy 185 S.  
 Sullivan, MO 63080  
 (573) 860-4308

**Jefferson County Satellite Office**  
 Eastern District Parks Office  
 Hwy 61  
 Festus, MO 63028  
 (314) 937-3897

**Kansas City**

**Jefferson City**

**St. Louis**

**Springfield**

**Poplar Bluff**

**Southwest Regional Office**  
 2040 W. Woodland  
 Springfield, MO 65807-5912  
 (417) 891-4300  
 FAX: (417) 891-4399

**Taney / Stone County Satellite Office**  
 Table Rock State Park  
 2037 State Hwy 165  
 Branson, MO 65616  
 (417) 337-9732

**Southeast Regional Office**  
 948 Lester Street  
 P.O. Box 1420  
 Poplar Bluff, MO 63901-1420  
 (573) 840-9750  
 FAX: (573) 840-9754

**Figure No. 8**



The police department should make routine checks of facilities and notify the City of any problems. The public works director is responsible for the emergency program and assignment of tasks. Routine problems will be handled by operating personnel, with the assistance of other city personnel as backup. City water system, sewer system, street maintenance, and power system personnel should be available in an emergency.

**B. Vulnerability Analysis of Major Plant Processes that Affect Effluent Quality**

**1. Power Outage**

Pump No. 3 in the influent pump station is equipped with an Auxiliary Liquid Propane Gas fueled Engine. A 500-gallon LP tank is located on a concrete pad on the South side of the lift station. The rate of consumption of the LP gas will vary according to engine speed and load. The standby engine will time delay start after a failure of utility power. The time delay relay may be manually adjusted from 0.2 to 60 seconds. If desired, the LPG engine also has a switch for manual operation of the crank motor. The liquid level control system in the wet well will also automatically transfer from A.C. level to control to standby 12-volt level control. When the water level in the influent wet well reaches 718.25 feet, the raw sewage will begin to divert into the flow equalization basin. The flow equalization basin provides approximately 260,000 gallons of storage.

A portable generator is to provide power for the ultraviolet disinfection system, the backwash pump and blower for filter backwash cycle and the filter building lights. The diesel generator is mounted on a 4-wheel trailer with a 100-gallon diesel fuel tank as part of the trailer bed. In event of power outage, the trailer must be brought to the North side of the filter building and connected to the generator receptacle on the exterior wall of the building. To transfer to generator power, the double throw switch located inside the building between the Motor Control Center and the lighting panel must be thrown.

The design does not provide backup power to the oxidation ditch blowers and motive in the event of a power outage. The sludge digester blowers will not operate when the plant is powered from the emergency generator.

The power company, White River Electric Co-op, phone (417) 335-9335, should be made aware of power outages soon after they occur. The crew should give restoration of power to the treatment facility a high priority. The City and power company should do everything necessary to restore power in time to prevent overflow of raw sewage. City maintenance personnel should take care of minor electrical problems at the treatment plant.

2. **Mechanical Equipment Breakdowns**

Mechanical breakdown effects and alternate operating modes are discussed in Chapter 3.

**C. Notification of Actual or Impending Spills or Discharges**

The Missouri Department of Natural Resources should be notified of any unavoidable spills or discharges, actual or anticipated.

Notification should be made first to the District Engineer of the Missouri Department of Natural Resources Southwest Regional Office (417) 891-4300. MoDNR personnel should be advised of the nature of the problem and their instructions followed.

For any emergency situation involving major releases, hazardous materials, contaminated water supplies, or fish kills, the operator must notify the regional office immediately. After hours and on weekends and holidays, the Department can be notified by calling the MoDNR 24-hour Environmental Emergency Response number (573) 634-2436.

**D. Emergency Chlorination**

The City should procure a case (twelve 5 lb. jars) of 70% Calcium Hypo-Chlorite (HTH) and store it in the chemical feed room at the water plant. This material should be applied to overflowing raw sewage if bypassing is occurring, after first receiving approval and instructions from the Missouri Department of Natural Resources.

**E. Emergency Force Main or Sewer Main Repair**

A break or stoppage in any of the main sewers or force mains must be repaired promptly to avoid overflow of raw sewage. In case of a break, shut off the pump stations immediately.

A broken or leaking main should be repaired using a new pipe section, clamps, or by other means from material stock carried for such emergency repairs to the sewer system. Stopped sewers should be rodded or otherwise opened with power rodding equipment.

## **F. Shut-down Procedures**

The following emergency shut-down procedures are provided for the operator's use. The main power coming into the plant can be shut down with the 600 Amp Main Breaker, Circuit No. 1A, at the motor control center in the filter control building. Power to most process equipment can be shut down by throwing the associated circuit on the motor control center (MCC) panel in the filter building. Most equipment located away from the MCC building has a disconnect switch located near by the equipment for emergency use.

### **1. Influent Pumps**

Each of the three influent sewage pumps could have the power disconnected by throwing the associated motor circuit breaker on the Pump Control Panel (PCP) which is located on the southern wall of the pump station. Power to the sewage pumps may be shut off at the PCP. The circuit breaker may be utilized when maintenance is necessary and can be used in an emergency.

### **2. Selector basin**

An enclosed 30 Amp non-fused disconnect is provided on the selector basin wall for each of the four selector basin mixers. Power may be shut off either at these disconnects or with the associated circuit breaker on the MCC panel.

### **3. Pretreatment**

The bar screen can be disconnected on the Bar Screen Controller located on the side of the bar screen structure. A 480 volt disconnect is provided on the subpanel of the controller. Electricity to the bar screen control panel can also be shut off at the motor control center. A 20 Amp circuit is provided for the bar screen breaker.

### **3. Oxidation Ditch Blowers and Motive Pumps**

The oxidation ditch motive pumps and blowers can be shut off by throwing the appropriate circuit in the motor control center. Also, 30 Amp disconnect switches are provided near each of the air compressors and mounted on the handrail at the mixer pumps for maintenance and emergency use. These switches should not be used during routine operation. Frequent operation will shorten the expected life of the switches.

4. Clarifier Drive Units

The clarifier drive units can be shut off in the MCC. Weatherproof disconnect switches are provided on the bridge handrail beside the header/skimmer drive motor to be utilized when maintenance is necessary or in an emergency.

5. Tertiary Gravity Filter

The filter backwash air scour system requires electricity, which can be shut off in the MCC room. The filter is a gravity filter and will continue to operate if a power failure occurs. If necessary, the filter may be manually backwashed with water only as described in number 11 of the Tertiary Gravity Filter section J of Chapter 3.

6. UV Disinfection System

Electricity to the UV structure can be turned off at either the UV power supply disconnects located on the wall beside the UV modules, the UV control panel, or at the Lighting panel (LP2) in the filter building electrical room. If necessary, flow through the UV channel can be isolated by closing both Valve I3 and I4, but doing such will not allow effluent from the plant.

7. Existing Plant Converted to Sludge Digestion

Existing plant equipment will be shut-down and operated as originally installed. See original plant O&M manual for necessary instructions.

# Sample

## WASTEWATER TREATMENT FACILITY

MONTH OF \_\_\_\_\_

February-08

[illegible]

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February-08

## T.S.S. WORKSHEET

[illegible]

Strong



Sample

February-08

## B.O.D. WORKSHEET

[illegible]

February-08

## SLUDGE REPORT

## Sample

[illegible]



# Sample

## DIGESTED SLUDGE WORKSHEET

[illegible]

## TEMPERATURE

Sample

## SAMPLE COLLECTION

Day	Initials	Refrigerator	B.O.D. Inc	T.S.S. Oven	Fecal Inc.		Initial	Time	Influent	Effluent
1									<input type="checkbox"/>	<input type="checkbox"/>
2									<input type="checkbox"/>	<input type="checkbox"/>
3									<input type="checkbox"/>	<input type="checkbox"/>
4									<input type="checkbox"/>	<input type="checkbox"/>
5									<input type="checkbox"/>	<input type="checkbox"/>
6									<input type="checkbox"/>	<input type="checkbox"/>
7									<input type="checkbox"/>	<input type="checkbox"/>
8									<input type="checkbox"/>	<input type="checkbox"/>
9									<input type="checkbox"/>	<input type="checkbox"/>
10									<input type="checkbox"/>	<input type="checkbox"/>
11									<input type="checkbox"/>	<input type="checkbox"/>
12									<input type="checkbox"/>	<input type="checkbox"/>
13									<input type="checkbox"/>	<input type="checkbox"/>
14									<input type="checkbox"/>	<input type="checkbox"/>
15									<input type="checkbox"/>	<input type="checkbox"/>
16									<input type="checkbox"/>	<input type="checkbox"/>
17									<input type="checkbox"/>	<input type="checkbox"/>
18									<input type="checkbox"/>	<input type="checkbox"/>
19									<input type="checkbox"/>	<input type="checkbox"/>
20									<input type="checkbox"/>	<input type="checkbox"/>
21									<input type="checkbox"/>	<input type="checkbox"/>
22									<input type="checkbox"/>	<input type="checkbox"/>
23									<input type="checkbox"/>	<input type="checkbox"/>
24									<input type="checkbox"/>	<input type="checkbox"/>
25									<input type="checkbox"/>	<input type="checkbox"/>
26									<input type="checkbox"/>	<input type="checkbox"/>
27									<input type="checkbox"/>	<input type="checkbox"/>
28									<input type="checkbox"/>	<input type="checkbox"/>
29									<input type="checkbox"/>	<input type="checkbox"/>
30									<input type="checkbox"/>	<input type="checkbox"/>
31									<input type="checkbox"/>	<input type="checkbox"/>

# Name of Wastewater Treatment Facility

Sample

**To Start:** Start with Step 1) and choose either spin data gravimetric data.  
If you have both, enter both.

## 1) Which type of data do you want to use:

Gravimetric ☒ y  
Spin ☐

Enter "y" in correct box. If providing both sets of data,  
gravimetric results will govern

## 2) Daily Operating Data

Only enter data in RED cells (or if "Clear Data" is used, enter data in blank cells only).  
When all data is entered press "Update Historical Log" button below.

Date	2/28/2008	
Influent Flow	MGD	0.261

### A-Basin Influent Parameters

Parameters	Units	Value
TSS	mg/L	308
COD	mg/L	
TKN	mg/L	
Ammonia (NH <sub>3</sub> -N)	mg/L	35.6
Nitrate (NO <sub>3</sub> -N)	mg/L	
Phosphorous, TP	mg/L	5.4

### Secondary Clarifier Effluent Parameters

Parameters	Units	Value
TSS	mg/L	3.2
COD	mg/L	
TKN	mg/L	
Ammonia (NH <sub>3</sub> -N)	mg/L	0.6
Nitrate (NO <sub>3</sub> -N)	mg/L	
Nitrite (NO <sub>2</sub> -N)	mg/L	
Phosphorous, TP	mg/L	0.3
Turbidity	NTU	

### Required Process Control Variables

Control Variables	Units	Value
ATC Spin %	%	
MLSS	mg/L	5,046
MLVSS	mg/L	
RAS spin %	%	
RAS conc.	mg/L	
RSF	gpm	
Clarifier core spin %	%	
Clarifier core conc.	mg/L	
WAS spin %	%	0.00
WAS conc.	mg/L	0
WSF	gpd	
Blanket Thickness	ft	2.0

### Other Control Parameters

Parameters	Units	Value
Alkalinity In A-basin	mg/L	
Alkalinity out A-basin	mg/L	
DO	mg/L	3.83
ORP, MLSS	mV	
ORP, RAS	mV	
NH <sub>3</sub> -N, A-Basin	mg/L	
NO <sub>3</sub> -N, A-Basin	mg/L	
Blanket with "fuzzles"	ft	3.5

### Gravimetric Results Governing

#### Calculated Parameters

Parameters	Units	Value
MLVSS/MLSS	ratio	0.00
Qras/Qinf	ratio	0.00
RSC/MLSS	ratio	0.0
WCR	mg/L per %	
ASU	lbs	336669.1
CSU	lbs	0.0
TSU	lbs	336669.1
RSU	lbs/day	0.0
ESU	lbs/day	7.0
XSU	lbs/day	0.0
WSU	lbs/day	7.0
MCRT	days	48333.3
SDTa	hours	735.6
SDTc	hours	#DIV/0!
Solids Flux	lb TSS/ft <sup>2</sup> /day	#DIV/0!
SOR	gal/ft <sup>2</sup> /day	#DIV/0!
Influent TSS	lbs/day	671
Effluent TSS	lbs/day	7
Influent NH <sub>3</sub> -N	lbs/day	77
Effluent NH <sub>3</sub> -N	lbs/day	1
OXF	hr mg/L	3712000
Estimated F/M	lbs/day/lb	#DIV/0!

# Name of Wastewater Treatment Facility

**To Start:** Start with Step 1) and choose either spin data gravimetric data.  
If you have both, enter both.

Sample

## 1) Which type of data do you want to use:

Gravimetric	<input checked="" type="checkbox"/>
Spin	<input type="checkbox"/>

Enter "y" in correct box. If providing both sets of data, gravimetric results will govern

## 2) Daily Operating Data

Only enter data in **RED** cells (or if "Clear Data" is used, enter data in blank cells only).  
When all data is entered press "Update Historical Log" button below.

Date	2/28/2008	
Influent Flow	MGD	0.261

### A-Basin Influent Parameters

	Units	Value
TSS	mg/L	308
COD	mg/L	
TKN	mg/L	
Ammonia (NH <sub>3</sub> -N)	mg/L	35.6
Nitrate (NO <sub>3</sub> -N)	mg/L	
Phosphorous, TP	mg/L	5.4

### Secondary Clarifier Effluent Parameters

	Units	Value
TSS	mg/L	3.2
COD	mg/L	
TKN	mg/L	
Ammonia (NH <sub>3</sub> -N)	mg/L	0.6
Nitrate (NO <sub>3</sub> -N)	mg/L	
Nitrite (NO <sub>2</sub> -N)	mg/L	
Phosphorous, TP	mg/L	0.3
Turbidity	NTU	

### Required Process Control Variables

	Units	Value
ATC Spin %	%	
MLSS	mg/L	5,046
MLVSS	mg/L	
RAS spin %	%	
RAS conc.	mg/L	
RSF	gpm	
Clarifier core spin %	%	
Clarifier core conc.	mg/L	
WAS spin %	%	0.00
WAS conc.	mg/L	0
WSF	gpd	
Blanket Thickness	ft	2.0

### Other Control Parameters

	Units	Value
Alkalinity in A-basin	mg/L	
Alkalinity out A-basin	mg/L	
DO	mg/L	3.83
ORP, MLSS	mV	
ORP, RAS	mV	
NH <sub>3</sub> -N, A-Basin	mg/L	
NO <sub>3</sub> -N, A-Basin	mg/L	
Blanket with "fuzzles"	ft	3.5

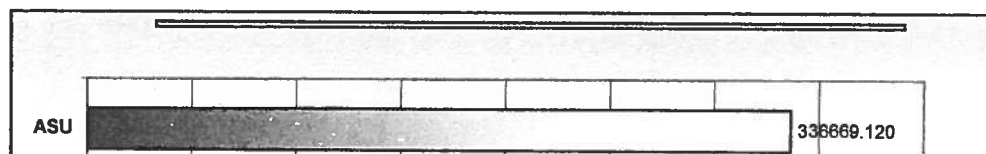
### Gravimetric Results Governing

#### Calculated Parameters

	Units	Value
MLVSS/MLSS	ratio	0.00
Qras/Qinf	ratio	0.00
RSC/MLSS	ratio	0.0
WCR	mg/L per %	
ASU	lbs	336669.1
CSU	lbs	0.0
TSU	lbs	336669.1
RSU	lbs/day	0.0
ESU	lbs/day	7.0
XSU	lbs/day	0.0
WSU	lbs/day	7.0
MCRT	days	48333.3
SDTa	hours	735.6
SDTc	hours	#DIV/0!
Solids Flux	lb TSS/ft <sup>2</sup> /day	#DIV/0!
SOR	gal/ft <sup>2</sup> /day	#DIV/0!
Influent TSS	lbs/day	671
Effluent TSS	lbs/day	7
Influent NH <sub>3</sub> -N	lbs/day	77
Effluent NH <sub>3</sub> -N	lbs/day	1
OXF	hr mg/L	3712000
Estimated F/M	lbs/day/lb	#DIV/0!

## 3) Update Historical Log

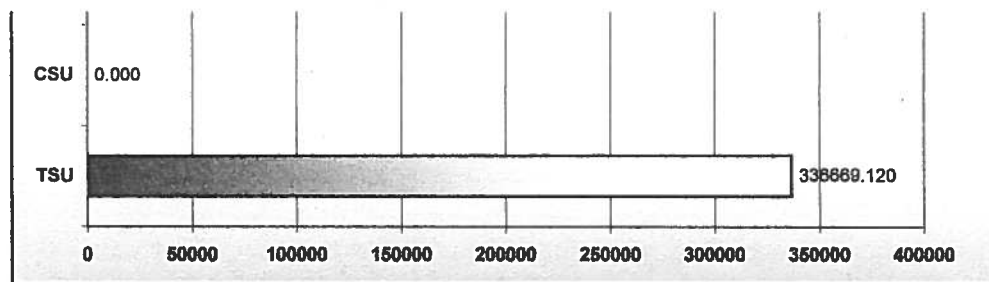
Update the historical log once Step #2, above, is complete.



4)

**Wasting Calculations**

Current WSF	0.0000	MGD
Current MCRT	48333.3	days
Target MCRT	10	days
Current WSC	0.00	mg/L
WSF for target MCRT:	#DIV/0!	gpd



Sample

5)

**Clarifier Operating Model – Based on Timed Settling Test and RAS Rate**

Input RED Data

BLUE data is calculated or imported from other locations

Blanket Thickness	2	ft
TSS in Clarifier Core - spin		mg/L
TSS in Clarifier Core - grav.	0	mg/L
TSS in Clarifier Core	0	mg/L
Flow to Plant	0.261	MGD
Number of Clarifiers	2	
Diameter of Clarifier(s)	0	ft
SW Depth of Clarifier(s)	0	ft
Depth at Center	0	ft
RAS Flow	0.000	MGD
TSS in RAS - spin		mg/L
TSS in RAS - grav	0	mg/L
TSS in RAS	0	mg/L
WAS Flow	0.000	MGD
TSS in WAS - spin		mg/L
TSS in WAS - grav	0	mg/L
TSS in WAS	0	mg/L
MLSS - spin		mg/L
MLSS - grav	5046	mg/L
MLSS	5046	mg/L
TSS in Effluent	3.2	mg/L

Total Flow to Clarifier(s)	0.26	MGD
Surface Area of Clarifier(s)	0.0	ft <sup>2</sup>
Overflow Rate	#DIV/0!	gpd/ft <sup>2</sup>
Volume of Clarifier(s)	0.0	gal
Solids Load IN	10983.8	lbs/day
Solids Flux	#DIV/0!	lbs/ft <sup>2</sup> /day
TSS in Clarifier Effluent	7.0	lbs/day
Solids in Clarifier	0.0	lbs
RAS Out	0.0	lbs/day
WAS Out	0.0	lbs/day
Total Solids Out	7.0	lbs/day
Solids Detention Time	0.0	minutes
Net Clarifier Solids	10976.9	lbs/day
Blanket Thickness Change	#DIV/0!	ft/hr
New BLT after 24 hrs	#DIV/0!	#DIV/0!

To view comments, place mouse in cells containing red triangles

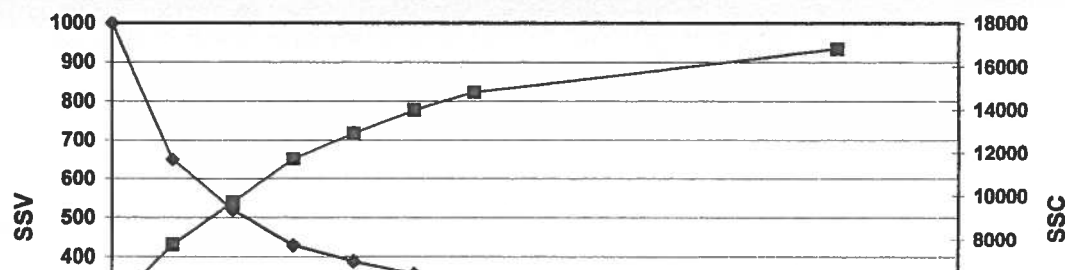
Gravimetric Data Governing

6)

**Settling Test Data**

2/28/2008

Time (min.)	SSV	SSC
0	1000	5046
5	650	7763
10	520	9704
15	430	11735
20	390	12938
25	360	14017
30	340	14841
60	300	16820

**Timed Settling Test**

Time (Minutes)	SSV	SSC
0	300	5000
25	320	5500
30	310	5200
60	280	4000

Sample

**NOTE: You MUST press this button after entering settling data, otherwise the data will NOT be saved on the Historical Data Log**

Return Sludge Flow Rate Estimation	
Desired RAS Conc	6000 mg/L
Estimated RSF	1.381 MGD
	958.7 gpm

**NOTE:**

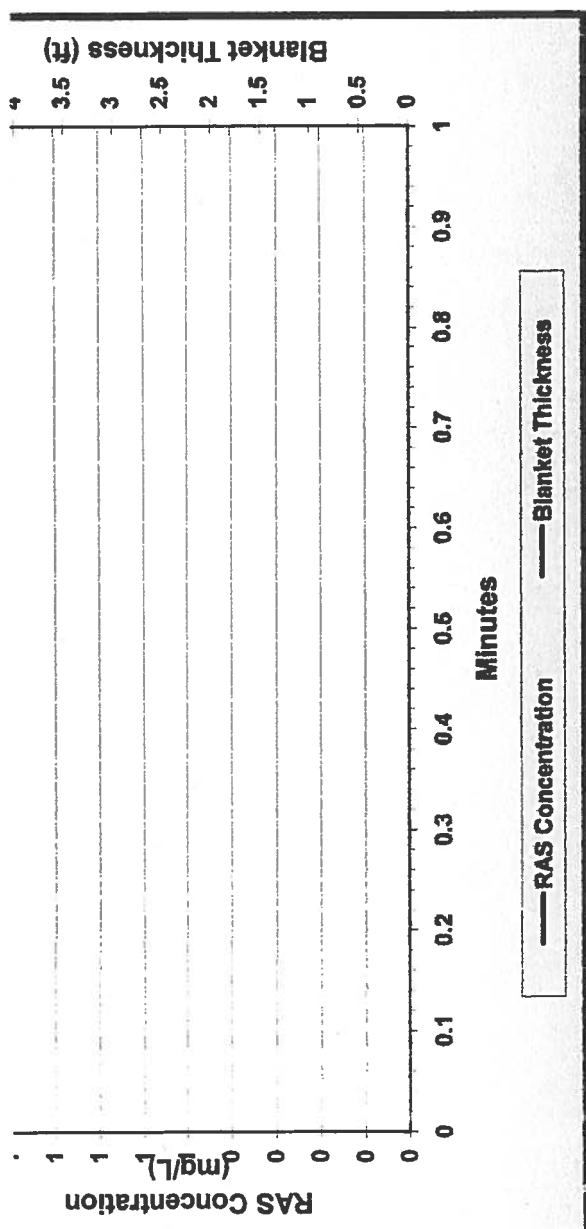
Settleometer data may only be applicable for a short duration. The clarifier performance predicted shown below assumes the system will continue to experience the same flows and settling characteristics that were seen when the settleometer sample was taken.

For more information go to the "help" file...

Blanket depth shown here is the thickness of the settled sludge. It does NOT include the "Fuzzy" layer! You may add the "Fuzzy" layer to get TOTAL BLANKET DEPTH.

Predicted Clarifier Performance	
1	4.5

Sample



## ATTACHMENT B

Date May 10, 2008

I have attached the I & I report to the April dmr for the Rockaway wastewater treatment plant MO-0108162.

Allen Bush Plant Manager



Date April 30, 2008

To: Regional Wastewater Plant MO-0108162

From: Rockaway Sewer Department

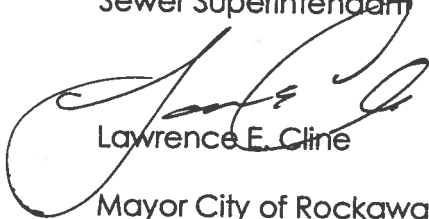
Sewer department will be putting some ordnances together for smoke testing and or video camera along the lake front on highway 176 in the summer months of July and August. We have I & I at the lift stations.

Thanks



Buck Godley

Sewer Superintendent



Lawrence E. Cline

Mayor City of Rockaway Beach